CHAPTER 11

SUGGESTIONS AND CONCLUSION
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11.1 SOLUTIONS TO THE PROBLEMS OF INDIAN MAGNESITE INDUSTRY

Only in the absence of basic problems, one can think of developing himself. The same applies to industries also. Presently the Indian magnesite industry faces very many problems. These problems must be solved first so that the industry can think of its development. Hence, a few suggestions are given in this chapter. It is hoped that these suggestions will help solve the problems of the industry and ensure development of the same.

11.2. SUGGESTIONS FOR IMPROVEMENT OF INDIAN MAGNESITE INDUSTRY

The suggestions are given under three heads, viz. (i) suggestions to Government of India, (ii) suggestions to the magnesite industry, and (iii) suggestions to the individual units of the industry. The suggestions also explain as how they will help the industry.

1.2.1 SUGGESTIONS TO GOVERNMENT OF INDIA

i) REVISING THE DUTY ON IMPORTED DBM

a) Due to the liberalisation of industrial policy of the Government of India, the duty on imported DBM was reduced
to 50% from 170%. This results in a lower cost of imported DBM than Indian DBM and has created crisis in Indian Magnesite Industry (IMI). Hence it is suggested that the Government should increase the duty on imported DBM so that the Indian DBM will cost lesser than imported DBM. This will make the Indian refractory manufacturers to prefer Indian DBM than the imported DBM.

b) If the Government feels that increasing the import duty for DBM will be detrimental to Indian industrial policy, the duty may be increased at least to neutralise the Indian price. This will also induce the Indian refractory manufactures to buy Indian DBM to avoid the various complicated procedures and formalities involved in importing.

ii) RESTRICTION ON IMPORT OF DBM

a) The import of DBM must be restricted with regard to quality and quantity as it has restricted the export of magnesia. For example, the restrictions may be that DBM, only above 95% MgO Content, can be imported and that too only upto 50,000 tpa. This will reduce the dumping of imparted DBM.

b) When a refractory manufacturer wants a particular grade of DBM and when it is available in India, he must be prevented from importing that grade of DBM.

c) When high grade DBM is mixed with low grade DBM, a medium grade DBM is obtained. The Indian refractory
manufacturers buy high DBM from foreign countries at a cheaper cost and also buy poor quality DBM in India again at a cheaper price and mix these two varieties to get a required quality of DBM. The same quality of required DBM may be available in India. But the Indian refractory manufacturers do not prefer the Indian DBM of that quality as its cost is higher than the cost of such mixed DBM. Such type of mixing by the Indian refractory manufacturers must be prohibited. This will help move that quality of DBM in Indian market.

iii) UTILISATION CERTIFICATE: The Indian refractory manufacturers import DBM for one purpose, stating that that quality of DBM (say 95% MgO content) alone is required for their purposes. But they use it for some other purpose for which a lesser quality of DBM (say, 90% MgO content) is enough. When 90% MgO content DBM is available in India, there is no need for importing 95% MgO content DBM. Hence, the actual users of imported DBM should be compelled to produce an 'Utilisation Certificate' confirming that the imported DBM was used for the same purpose for which it was imported. Such an 'Utilisation Certificate' will automatically restrict the import of DBM and make use of the Indian DBM.

iv) ESTABLISHMENT OF A SEPARATE R & D INSTITUTE:

a) R & D activities are very much essential for the development of any industry. But, it will require
substantial investment in establishing laboratories and operating (testing) costs. It is not possible for the individual units of the IMI to make such investments and incur expenses. Hence the Government of India (GOI) must establish an R & D institute exclusively for IMI which may help the Industry to conduct research to increase its efficiency. Research may be conducted to improve the quality of ore, increase fuel efficiency, increase waste recovery, improve production efficiency, reduce costs, etc.

b) If the establishment of a separate R & D institute is not possible by Government of India, a substantial amount of grant may be sanctioned to IMI to carry out R & D activities collectively.

v) RELAXATION OF RESTRICTIONS ON EXPORT: The restrictions on the export of Indian magnesite must be either removed or relaxed. It will make the Indian magnesite producers to export the low-grade raw magnesite and other magnesia products. This will also fetch foreign exchange.

vi) ENCOURAGING PRODUCTION OF NEW MAGNESITE PRODUCTS: The production of fused magnesia from calcined magnesite requires large quantity of electricity. The unit which desires to produce fused magnesia must be allowed to establish its own power generation unit to be used for the production of fused magnesia.
NB: The import of fused magnesia by India was 79,588 tonnes costing Rs. 46,13,89,000 in 1990 - 91. If fused magnesia is produced in India, it can save foreign exchange considerably.

Thus the production of new magnesite products must be encouraged by the Government of India.

vii) DIRECTION TO INDIAN STEEL INDUSTRY: As already stated, more magnesite is consumed by the iron and steel industry. The major units of the steel industry are owned by the government. Hence, the government must direct that the government owned steel making units must consume at least a portion of their requirements from IMI.

viii) SUPPLY OF FURNACE OIL AT CONCESSIONAL RATES: One of the major reasons for the higher costs of Indian DBM is due to the higher cost of furnace oil which is required for the production of DBM. The government must supply furnace oil to IMI at international prices so that the cost of Indian DBM will be less, at least to some extent, and hence it can compete with the imported DBM.

ix) REDUCTION OF EXCISE DUTY: The excise duty on DBM must be reduced so that it will cost less to the Indian buyers of DBM.
GREATER AUTONOMY TO GOVERNMENT UNDERTAKINGS: In the cases of government undertakings of the IMI, the managements must be given greater autonomy, coupled with appropriate accountability, to take all necessary steps by themselves to improve their performance and achieve efficiency.

11.2.2. SUGGESTIONS TO INDIAN MAGNESITE INDUSTRY

i) UNITING OF INDIAN MAGNESITE PRODUCERS: The Indian Refractory Manufacturers Association (IRMA) takes care of the development of the refractory industry. Indian magnesite producers are members of IRMA. But, no proper attention is given by IRMA for the development of its feeder industries like the magnesite industry. Hence, the Indian magnesite producers should form an association to look after their welfare. This association may be called 'Indian Magnesite Producers' Association' or Indian Magnesite Syndicate'. Its major functions may be: taking all steps to solve the common problems faced by the industry, establishing good rapport with the government, identifying the new developments and improvements taking place in the magnesite industries of other countries, taking steps to implement these developments in IMI, dealing with other user industries to study their requirements of magnesite products and take steps to fulfill them, etc.
This association can take essential steps for the development of the industry. At a time when the IMI is struggling for survival, the Indian magnesite producers can represent their problems to the government through this forum and it will have its effect on the principle of 'union is strength'.

ii) ESTABLISHMENT OF A COMMON R & D INSTITUTE: The IMI requires research on many aspects (already explained) for its development. For instance, bio-technology can help enhance gold recovery from ore more economically (The Hindu, 14.4.93; Coimbatore Edn., Page 17). This technology may be tried in magnesite industry also to increase magnesite recovery from the magnesite ore. But such type of research will require more expenses and special concentration, which a single unit of the industry can not afford. If there exists an R & D institute exclusively for IMI, it can carryout such research. Hence, if government could not establish an R & D institute exclusively for IMI, the industry must establish a common R & D institute.

iii) ESTABLISHMENT OF MATERIALS COMMONPOOL (MCP): It has been noticed that more spares remain idle in stores for long-periods. The investment in such idle items is a dead investment. To avoid this dead investment or atleast to minimise it, a materials common pool (MCP) can be established. The details of MCP, its mode of establishment, management, functions, merits and demerits, etc. are
explained in Appendix 10.3. The MCP will ensure the supply of 'qualified items' at a reasonable price and immediately at the time it is required.

iv) ESTABLISHMENT OF MAGNESITE TRADING CORPORATION (MTC): To improve the marketability of magnesite products, a Magnesite Trading Corporation (MTC) may be established. The MTC will take care of the marketing activities such as finding new customers both in India and abroad (if restriction on export is relaxed) and will establish standards of sale relating to price, credit terms, channel of distribution, packing, transport, advertisement etc including market research.

11.2.3 SUGGESTIONS TO INDIVIDUAL UNITS

(i) APPLICATION OF SCIENTIFIC PRINCIPLES AND TECHNIQUES: Most of the activities in these units are performed in the traditional way. For instance, (i) the work standard for mine workers were fixed long-back casually and they still continue even after some amount of machanisation has taken place, (ii)there is no delegation of authority and almost all decisions are taken by the chief executives (iii) no scientific technique is used for the proper control of inventory, (iv) the overall performance of employees are rated annually, (v) investment decisions are taken based on importance, etc.
These activities can be performed more efficiently through the application of scientific principles and techniques. For example, work standard for mine workers can be revised through time and motion study, proper authority coupled with accountability may be delegated to subordinate managers; inventory control techniques such as ABC analysis, HML analysis etc. and EOQ can be applied; the performance of employees can be rated periodically on some pre-determined characteristics such as job knowledge, ability to learn, initiative, absenteeism, co-operation with supervisor and co-workers, etc., through a properly designed performance appraisal form; investment decisions can be made with the help of capital budgeting techniques; etc. In short, the units must apply the scientific principles and techniques wherever possible.

(ii) IMPROVEMENT OF THE ORGANISATION STRUCTURE: More levels in the management hierarchy of these units can be reduced and improved as explained in chapter 10. The improved organisational structure is given in chart 11.1. (next page).

(iii) DEVELOPMENT OF MANUALS: The units do not have any manual relating to policies and administrative practices. This results in difference of opinion between the management and the employees and also among the employees themselves. To avoid such problems organisational manuals must be developed and used by these units.
(iv) DEFINITE POLICIES: The managements of these units must clearly spell out policies on promotion, transfer, filling up of vacancies, investment in equipments and inventory, maintenance of equipments, etc. Once the organisational manuals are developed, this aspect will be fulfilled.

(v) SIMPLIFICATION OF SYSTEMS AND PROCEDURES: The existing systems and procedures have been evolved over the lapse of time. With the help of O & M technique, these systems and procedures must be simplified to achieve efficiency in administrative activities.

(vi) APPLICATION OF COST REDUCTION TECHNIQUES: Reducing cost is one way of increasing profits and it is in the hands of the management. Examples of costs which could be reduced in these units are: consumption of furnace oil either by changing the process of burning or by increasing the heat efficiency of the fuel, administrative costs through work simplification, expenses on power consumption in offices, traveling expenses, stationary, telephone bills, recreation etc. The management must take essential steps to reduce costs. A separate cost reduction wing may be established permanently to study each cost and suggest cost reduction measures. A massive cost reduction programme may be organised to reduce costs and wastes throughout the organisation.
(vii) PREPARATION OF ANNUAL REPORTS BY INDIVIDUAL UNITS: In the case of two sample units which are members of group companies, annual accounts and reports are prepared for the group as a whole and not for the individual units. This does not provide sufficient information to assess the performance of individual units. Hence, the individual units must prepare annual accounts and reports relating to capital structure, return in investment, working capital, production, sales, costs, etc. exclusively for each unit. This will help the individual unit to appraise its performance so that corrective measures, if needed, may be taken.

(viii) PRODUCING HIGH GRADE MAGNESIA BY 'MIXING': The units can themselves import high grade DBM and mix it with the low grade DBM available with them to get a medium grade variety of DBM. As the Indian refractory manufacturers want a high purity DBM than that of Indian DBM, this mixed variety can serve their purpose. This method will make use of the Indian DBM and also will result in moving the Indian DBM.

(ix) PERFORMANCE APPRAISAL OF FUNCTIONAL DEPARTMENTS: The performance of each functional department must be appraised to assess its working. This will help the management to identify where the department lacks efficiency and what problems are faced by the head of the department so that corrective measures can be taken.
The proforma given in Appendix 11.1 can be used as a tool to assess the performance of the departments. This is only a model. The characteristics / aspects mentioned in the proforma are not exhaustive. They can be altered as warranted by the concerned unit.

(x) PUBLICATION OF HOUSE JOURNAL: The 'House Journal' will educate the employees on many aspects such as changes taking place in the industry, science and technology, government policies, etc., progress of the company, problems faced by it, etc., and can help personality development. Thus the 'House Journal' will act as a tool for increasing the morale of employees and will result in satisfactory industrial relations. Hence, each unit must publish a 'House Journal' of its own, periodically.

Though this publication may involve cost, no doubt, the value of benefits the company can enjoy will be significant.

(xi) DETERMINING THE QUANTUM OF INVENTORY TO BE MAINTAINED: How much inventory must be maintained is a difficult question to answer. The quantum of inventory to be maintained varies from company to company. The cost of materials in the cost of production of a product depends on the nature of the product. In the case of magnesite products, the materials cost is very less compared to the total cost. The company must decide its policy as how much
inventory must be maintained to ensure steady supply and avoid stock-outs. The inventory must be controlled scientifically through various inventory techniques. Periodical review of the inventory position must be made and corrective measures must be taken whenever necessary. This will help reduce the investment in inventory.

(xii) ECONOMIC DISPOSAL OF IDLE INVENTORY: Items which are not used for more than one year after their receipt, and found that they will not be required in future, must be disposed of immediately to achieve economy. Similarly, if a new improved item has come to the market and if the company decides to use that new item in future, then, the existing stock of old items must be immediately disposed.

Also, if an equipment is to be disposed, then all inventories of that equipment must be disposed immediately.

For an economical disposal of such items, the materials department must find out the actual users of these items. This will fetch more money than disposing them as scrap or obsolete.

(xiii) MAINTENANCE OF RECORDS FOR EACH MACHINE: Log-books must be maintained for each machine and equipment to record the date of maintenance, parts changed, mechanic attended, down time etc. This record must be periodically reviewed to decide whether to use the equipment or dispose it.
The best policy is "Invest in equipment than in inventory".

(xiv) TRAINING FOR MAINTENANCE PERSONNEL: Lack of knowledge about the various parts of an equipment, the nature of each part, its functions, its normal life etc. and lack of proper planning of the requirements of spares result in idleness of both equipments and spares. This situation can be avoided by giving an indepth training about each machine and equipment. It is better to give such training even before buying a machine. This training may be given in the company itself if facilities are available or in the manufacturer's place at company's cost. This will help the maintenance people to plan and perform maintenance work successfully.

(xv) MOTIVATING MAINTENANCE CREW: The maintenance crew may be motivated for efficient performance through rewards. For example, if a machine maintained (serviced or repaired) by a mechanic performs well for a desired period, he may be given some reward. If the machine performs still better than the expected period, he may be given additional rewards.

If a group of persons are responsible for the maintenance of the machine, the reward may be shared by them.

What rewards could be given may be decided by the management considering the kind of machine, its condition, work load, etc.
SCIENTIFIC SELECTION OF PERSONNEL: "The major reason for the poor performance of employees and labour unrest is the absence of aptitude for working" (BMPA News - A Graphics Communications - monthly, Bombay, July 90, Page8). Hence, before selecting an employee he must be tested whether he has an aptitude for the work for which he seeks employment. For this purpose aptitude tests may be conducted before selecting an employee, which the present system of personnel selection lacks.

ENRICHING JOBS: Job enrichment refers to loading the job by using more of the person's talents and giving more freedom in decision making. The units must enrich the jobs through proper training.

REDUCING ABSENTEEISM: Absenteeism must be reduced to ensure steady production. Absenteeism can not be reduced over night. It can be reduced through repeated preaches and advice and explaining as how it will result in monetary loss to them directly and indirectly and also how it affects the company and the country.

HEALTH AND SAFETY MEASURES: To avoid complaints from workers about health due to their occupation, they must be compelled to wear 'dust mask' while working.

INTRODUCTION OF NEW INCENTIVE SYSTEM: Presently, there is resistance among the mine workers to increase their
man-day production. By introducing suitable incentive system the man-day production of raw magnesite can be increased. Two incentive systems are suggested as explained below:

(a) INCREASE IN ANNUAL BONUS RATE AS INCENTIVE

For the existing man power, fix the annual target of raw magnesite production, say one lakh tonnes. For this standard level of annual production, fix the annual bonus rate, say 20%. If the annual production of mine increases, increase the bonus rate on some basis, say slab basis. The suggested slab basis and the corresponding bonus rates are given below:

<table>
<thead>
<tr>
<th>Annual Production of raw Magnesite (lakh tonnes)</th>
<th>Bonus rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upto 1</td>
<td>20.00</td>
</tr>
<tr>
<td>1.00 to 1.05</td>
<td>21.00</td>
</tr>
<tr>
<td>1.05 to 1.10</td>
<td>22.25</td>
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<tr>
<td>1.10 to 1.15</td>
<td>23.75</td>
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<tr>
<td>1.15 to 1.20</td>
<td>25.50</td>
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<tr>
<td>1.20 to 1.25</td>
<td>27.50</td>
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<tr>
<td>1.25 to 1.30</td>
<td>29.50</td>
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<tr>
<td>1.30 to 1.35</td>
<td>31.75</td>
</tr>
<tr>
<td>1.35 to 1.40</td>
<td>33.00</td>
</tr>
<tr>
<td>1.40 to 1.45</td>
<td>35.50</td>
</tr>
<tr>
<td>1.45 to 1.50</td>
<td>38.00</td>
</tr>
</tbody>
</table>
The bonus rates for each slab may be finalised after negotiations between the management and worker unions.

THE MERITS OF THIS SYSTEM ARE:

* recording of daily production for each worker is avoided which is a time consuming and tedious job.
* the worker will be happy when he gets a lump sum at one time.
* productivity will be more as the workers will be induced to produce more.

THE DEMERITS OF THE SYSTEM ARE:

* It is natural for any human being to get immediate reward for his services. Under this system as the workers get the reward only once in a year, they may not be motivated to produce more.
* under this system, individual efficiency is not respected. Some efficient workers may be dissatisfied as both efficient and inefficient workers will get the same rate of bonus.
* huge sums of funds are required at one time.

CONDITIONS: Under this system a maximum rate of bonus say 35% or 40 % must be fixed after considering the policies of the government on bonus etc. and the problems due to increased production.
(b) INCENTIVE ON MONTHLY PRODUCTION BASIS

Fix the quota per worker per month, say 10 tonnes. If he produces more than this quota, say 12 tonnes, he may be given some incentive for the additional production of 2 tonnes.

In introducing such an incentive system, one more aspect to be considered is the role of non-productive workers in the mines. The non-productive workers such as drillers, blasters, earth moving equipment operators, foremen, mates, maistries, etc. also help increase production of mine workers. They must also be suitably rewarded failing which they will not co-operate to increase production.

The increase in benefits due to this increased production may be determined by the company. This additional benefits may be shared by the productive workers, non-productive workers and the company. The ratio of share of increased benefits may be finalised after negotiations between the management and worker unions.

THE MERITS OF THIS SYSTEM ARE:
* the workers will be induced to produce more as individual efficiency is respected.
* all people working in the industry are benefited.
* it will increase the morale of the workers.
THE DEMERITS OF THIS SYSTEM ARE:

* production of raw magnesite may be heavy towards the end of each month. It may pose many problems such as transporting, removal of spoil, etc.

* a worker who was absent for many days in a month may not be induced to produce more as he has to make up the monthly quota first and then go for incentive production.

CONDITIONS: Under this system, a maximum limit for the incentive production must be fixed so that the other activities of the firm also will be under control. Further, the absence of worker during a month must be limited to make him eligible for incentive production.

ARRANGING FOR PERSONALITY DEVELOPMENT COURSES: It is not enough if a production worker knows only about the production process; he must also know something about the problems faced by the management in marketing, finance, materials purchase, etc. It is not enough if he knows government regulations relating to his protection and benefits; he should also know the various government regulations governing the business. Hence, to make him knowledgeable, personality development courses must be conducted periodically. This will make him not only to know about his company but also to co-operate with the management. The House Journal may contribute to this considerably.
EXTERNAL PERSONNEL COUNSELOR (EPC): Though established procedures are available to redress the grievances of employees, they are not free from grievances. The managements are of the view that the employees do not freely approach them for redressal of their grievances. At the same time, the employees have the fear that the managements will take revenge on individual employees who brings in any grievance against the higher-ups. This tie can be removed with the use of an External Personnel Counselor.

The EPC shall be a person not connected in any way with the company. He may be a psychologist or a lawyer or a management consultant. The employees will feel free enough to express their feelings and grievances to the EPC. He may bring them to the knowledge of the management hither-to which was neither aware of such grievances nor aware of its mistakes. He may also suggest suitable measures for redressing such grievances. This will improve the morale of the employees.

ESTABLISHING SATISFACTORY INDUSTRIAL RELATIONS: Satisfactory industrial relations is said to exist in an organisation when its employees have high morale. To achieve high morale, the following are suggested.

* Recognise the services of an employee and make him feel that he is a part of the organisation.
* Do not be fault-finders, rather be educators and promoters of the interests of the employees.

* If the performance of an employee is not satisfactory, do not punish him immediately, but find out the reasons for it and take steps to bridge the gap.

* Exercise personal counseling. Direct approach solves many problems easily.

* Be frank and open in all matters. It will make employees to trust the management.

* Provide scope for personal development.

* Have humanitarian approach towards his personal problems.

* Provide him immediate benefits for his exceptional performance.

* Redress his grievances immediately and judiciously.

* Provide opportunities to involve himself in the activities of the organisation.

(xxiv) MANAGING FUNDS OF THE COMPANY EFFICIENTLY: The funds of the company must be efficiently managed through proper budgetary control, projected fund-flow statements, ratio analysis, etc. to achieve the objective of 'wealth maximisation' which is very much essential for the success of the company in the long-run.
(xxv) MANAGING CHANGE EFFICIENTLY: Change is the essence of growth and edict of management. Change, when consciously imposed from within opens new avenues for growth.

When a company proposes to introduce a change in the existing system, Usually there is residence from the employees. Especially when the change requires more skill and work from the employees or has scope[e for retrenchment, the residence is very high. But for the growth of the organisation introducing changes is inevitable.

The Indian magnesite industry is in a position that it requires many changes. The following ten steps (TEN COMMANDMENTS OF CHANGE) are suggested to be followed by these units, for efficiently and successfully managing a change.

TEN COMMANDMENTS OF CHANGE

1. Make the employees aware that a change is to be introduced. (This will create an interest in them to know about the change).

2. Make the employees realise the direct and indirect benefits of the change to them and them only (It will motivate them to accept the change).

3. Inform them the purposed change but do not implement it immediately (It will make them analyse the merits and demerits of the change).
4. Explain the difference between the existing system and the proposed system. (It will gain their acceptance of the change).

5. Inform them that they are going to do the same job which they were doing so far, but, in a better and easier way (It will make them invite the change).

6. Ask for their comments and suggestions for the betterment of the change (It will make them think deeply about the change).

7. Inform them that they will be given sufficient training, if necessary, at company's cost (This will make them happy).

8. If there is still resistance from a section of the employees, convince them. Do not thrust the change on them. (It will make them accept the change whole heartedly).

9. Implement the change with the acceptance and co-operation of the employees (It will create an involvement in the minds of the employees, in the effective implementation of the change).

10. Inform them periodically about the achievements made due to the change and how it has benefited them. (It will lead to the implementation of the change successfully and also it will result in better management - employees relations).
11.3. SCOPE FOR FURTHER RESEARCH

The scope for further research in the Indian magnesite industry is in the following areas:

1. Developing a technique for ore concentration to improve the quality of raw magnesite economically.

2. Developing a method to increase waste recovery from run-of-mines.

3. Studying the aspects involved in the application of biotechnology in magnesite mines.


5. Achieving optimum fuel efficiency.

6. Deciding the optimum size of inventory to be maintained by each unit.

7. Developing a technique for the efficient maintenance of machines and equipments.

8. Determining the optimum size of spares to be maintained for each machine and equipment.


10. Determining the optimum size of working capital and the mode of financing it.
The IMI had a smooth sailing till the beginning of nineties. Presently, it is being influenced by many forces. Unless these forces are successfully fought, the future of IMI will be bleak.

Since the IMI was in the sellers’ market during the past, it has failed to take steps for its improvement and development. The major areas in which the IMI has failed to improve include the following:

i) failure to ensure optimum use of available magnesite using improved technology;

ii) failure to prevent waste of low-grade magnesite;

iii) failure to consider the improvements taking place in other magnesite user industries and make corresponding improvements in the magnesite industry, simultaneously;

iv) failure to reduce cost of production; etc.

Due to these failures, the IMI has happened to be diffused by many forces.

Some of the major attacks on IMI are;

i) as the mines go deeper, the quality of magnesite decreases. When the recovery rate of high grade magnesite was 75% at a depth of 30 meters below ground level, it is only 60% at a depth of 40 meters.
ii) Due to change in steel making process, the steel industry requires only high quality magnesite which the IMI lacks.

iii) More DBM is imported at a cheaper cost due to liberalisation of industrial policy.

iv) Cost of production of Indian DBM is increasing significantly.

v) Substitutes to magnesite bricks have been developed (For instance, the steel industry has shifted to dolomite bricks from magnesite bricks).

Unless the IMI takes appropriate steps to fight with these forces strongly and successfully, the future of IMI will not be that much bright as it was in the past.

11.5 CONCLUSION

As discussed elaborately, the magnesite industry plays a significant role in the development of the country. Such a vital mineral is scarce in India. Especially, the recoverable reserves of high quality magnesite are very limited and are fast dwindling. Hence efforts must be taken for the judicious and optimum utilisation of the available magnesite reserves for the benefit of the various industries of the country.

But due to change in environment and government policy the IMI is passing through a difficult period. It is very
essential that the industry must resort to high quality research and development activities so that it can maintain its share in the market.

The industry must make an attempt to ensure the optimum utilisation of magnesite using improved technology and to prevent waste of low-grade magnesite.

The development in other industries, particularly in the magnesite consumer industries must be duly considered. When there is an improvement in the user industry, the magnesite industry must also take steps to make a corresponding improvement in it simultaneously. Unless the IMI joins the race of international technological developments, it will have a tough time even to survive.

For its survival, it has to take many steps, the major ones being (i) improving the quality of raw magnesite by some beneficiation method, and (ii) finding new uses and markets for the low-grade magnesite.

Efforts must be taken in such a way that from each unit of magnesite mined, we get the maximum mileage.

Improving the quality of ore, finding new uses of magnesite, recovering the waste from run-of-mines, reducing costs, increasing all round efficiency, achieving productivity, etc. are the needs of the hour.
Hence a joint and concerted action is warranted by the exploring, exploiting and consumer agencies to discover new occurrences, to conserve magnesite of refractory grade, to beneficiate the low-grade ore, to put different grades into optimum utility and to reduce cost of operation.

It is earnestly believed that the various measures suggested will give a new life to the Indian magnesite industry.

The researcher presents this report with the hope that this will draw the attention of the Government, managements of the various units of the Indian magnesite industry, experts in the field of magnesite and future researchers. If the study helps them in any form, the researcher will feel that his efforts are amply rewarded.